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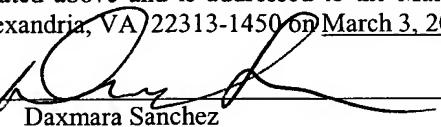
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By:


Daxmara Sanchez

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: John E. Lindholm et al. **Confirmation No.:** 7963

Serial No.: 10/032,894 **Art Unit No.:** 2672

Filed: 10/26/01 **Examiner:** Wang, Jin Cheng

Title: "LIGHTING SYSTEM AND METHOD FOR A GRAPHICS PROCESSOR"

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37 C.F.R. § 1.193 REPLY BRIEF

Sir:

Applicants submit that the Examiner has still not established proper grounds for rejecting claims 24-25 and 27-34. In particular, the Examiner still fails to point to elements in *Krech* (U.S. Patent No. 6,184,902) that correspond to applicants' claim elements. For example, the Examiner fails to point to an element in *Krech* that properly corresponds to applicants' claimed "lighting logic unit." Additionally, the Examiner does not properly address the coupling between the lighting logic unit, the multiplication logic, and the conversion module. And further, the Examiner fails to point to an element in *Krech* that corresponds to applicants' claimed multiplication logic that includes a feedback loop. These issues are addressed below under the

corresponding headings. Applicants' full arguments are set forth in the Appeal Brief, and Applicants are not waiving any of those arguments by focusing on a subset of those arguments in this Reply Brief.

I. OVERVIEW OF THE EXAMINER'S POSITION

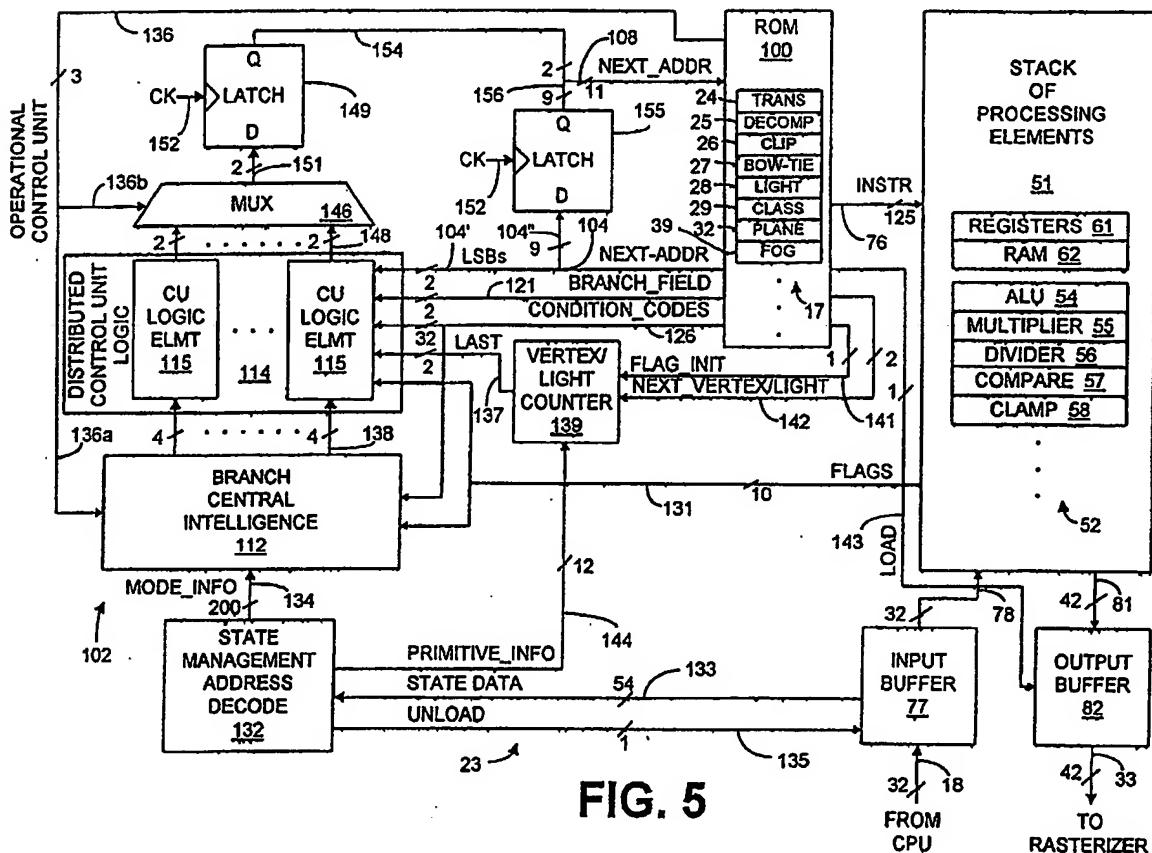
Before addressing the merits of the Examiner's positions, a brief overview of those positions may be helpful. Claims 24, 30, and 34 recite a few basic elements: an input buffer, a multiplication logic unit, an arithmetic logic unit, a register unit, and a lighting logic unit. These elements are described specifically in the claims and this overview is not meant to replace that claim language. Rather, this overview is meant to provide a starting point for understanding the Examiner's positions.

In the Answer and the previous Office Actions, the Examiner identified the *Krech* elements that supposedly corresponded to applicants' claimed elements. At times, the Office Actions are not clear about which elements correspond to which claim limitations, but applicants believe that the chart below accurately sets forth the Examiner's positions

Element Recited In Applicant's Claim	Examiner's Position Regarding The Corresponding Element in <i>Krech</i>
input buffer	input buffer 77 (Figure 5)
multiplication logic unit	multiplier 55 (Figure 5)
arithmetic logic unit	ALU 54 (Figure 5)
register unit	registers 61 (Figure 5)
lighting logic unit	control unit logic element 115 (Figure 5)
conversion module	control unit 17
multiplication logic unit with the feedback loop	Office Action does not point to any element directly. The material cited in the appeal brief only addresses the <i>Krech</i> branch central intelligence mechanism 112 in Figure 5.

Table 1: Summary Of The Examiner's Position

Because *Krech* Figure 5 is the core of the Examiner's rejection, it is reproduced below for convenience.



Krech Figure 5

II. **KRECH DOES NOT TEACH APPLICANTS' "CLAIMED LIGHTING LOGIC UNIT."**

Claim 24 recites “a lighting logic unit coupled to the arithmetic logic unit, the at least one input buffer, and the multiplication logic unit.” Notice that the language recites a “lighting logic unit” and a specific relationship between the “lighting logic unit” and the other elements. Claims 30 and 34 recite a similar—although not identical—limitation.

The Examiner argues that the *Krech* control unit logic (element 115 in Figure 5) corresponds to applicants “lighting logic unit.” But according to *Krech*’s own specification, the

control unit logic 115 is not a lighting logic unit as applicants' claim. Rather, *Krech*'s control unit logic 115 is a controller that does not perform the functions of a lighting logic unit. Thus, *Krech* does not teach applicants' claimed lighting logic unit and *Krech* does not anticipate any claim that recites the element.

General lighting units and lighting modules are known in the art. Applicants' claimed lighting logic unit and its relationship to the other claimed components, however, is not known in the art. But before addressing the uniqueness of applicants' combination of elements, it is useful to describe the basic functions of lighting logic units.

Known lighting modules are generally responsible for lighting vertices. Applicants actually describe the basic functions of a lighting module in their specification at page 2:

[The lighting module] is responsible for lighting vertices according to various lighting parameters. The lighting parameters may include, for example, a stack of the current lights along with their associated parameters, the ambient light level, and a material. The various lighting and shading models as well as various other parameters of the lights themselves may determine how a vertex should be lit, as is well known in the art.

Krech's control unit logic element is not a lighting module because it does not perform any of the functions that are typical to a lighting module. *Krech*, for example, describes that its control unit logic element "is configured to make lower level logical decisions to help each respective control unit 17 accomplish conditional branching and to control indirect addressing."

Krech, column 6, lines 41-44. *Krech* also states that "each of the control until logic elements 115 (FIG 5) is configured to evaluate and define a next address field 104 for a currently executing instruction associated with a corresponding ROM-based control unit 17." *Krech*, column 7, line 13-17. Notice that *Krech* does not mention that its control unit logic element performs any function related to lighting. Accordingly, *Krech*'s control unit logic element cannot correspond

to applicants' claimed lighting logic unit, and *Krech* cannot anticipate any claim that recites the "lighting logic unit."

III. *KRECH* DOES NOT TEACH THAT "THE LIGHTING LOGIC UNIT IS COUPLED TO THE MULTIPLICATION LOGIC UNIT VIA A CONVERSION MODULE."

As described in Section II, *Krech* does not teach applicants' claimed lighting module. Moreover, *Krech* does not disclose applicants' claimed connection of a conversion module of the lighting logic unit and the multiplication logic unit. No element in *Krech* serves as a lighting logic unit and is coupled to the multiplication logic unit via a conversion module.

IV. *KRECH* DOES NOT TEACH APPLICANTS' CLAIMED MULTIPLICATION LOGIC UNIT WITH A FEEDBACK LOOP.

Claim 30 recites that the "multiplication logic unit has a feedback loop coupled to an input of the multiplication logic unit." According to the Examiner, the *Krech* multiplier (element 55 in Figure 5) corresponds to applicants' claimed multiplication logic unit. But the *Krech* multiplier 55 does not include a feedback loop—see Figure 5 for example.

The Examiner argues that a *Krech* discloses a feedback loop at column 11, line 45 through column 13, line 15 and Figures 5 and 7 to support the rejection. But the Examiner does not assert that this feedback loop is related to the *Krech* multiplier 55. In fact, the material that the Examiner cites as teaching a feedback loop has no relation to the *Krech* multiplier 55 or to any other multiplication logic unit.

The Examiner-cited *Krech* material relates to Figures 7A, 7B, and 7C. And as *Krech* states, these figures "illustrate a state diagram for a possible implementation of the branch central intelligence mechanism 112." *Krech* illustrates this branch central intelligence mechanism 112 in Figure 5. Accordingly, the Examiner's only support for rejecting applicants claims that recite the multiplication logic unit with a feedback loop relates to *Krech*'s central intelligence

mechanism 112. The Examiner never acknowledges that the *Krech* multiplier 55 does not include a feedback loop.

Applicants' claims recite that the "multiplication logic unit has a feedback loop coupled to an input of the multiplication logic unit." The Examiner first argues that the *Krech* multiplier 55 corresponds to applicants' claimed multiplication logic unit. The Examiner then argues that the feedback loop is taught by the central intelligence mechanism 112. These positions are inconsistent. To support this portion of the 35 U.S.C. § 102 rejection, the Examiner must point to a multiplication logic unit in *Krech* that includes a feedback loop. That is, the Examiner must demonstrate that the *Krech* multiplier 55—which according to the Examiner corresponds to applicants' multiplication logic unit—includes a feedback loop. But the Examiner does no such thing, and thus cannot support the rejection against claims 30 and 34

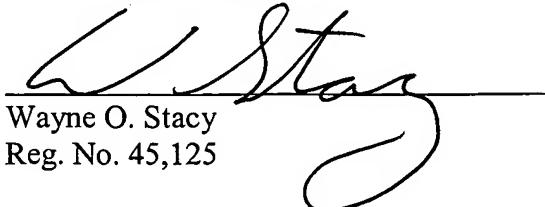
SUMMARY

Applicants disagree with much of the Examiner's characterization of the state of the art, the references, and applicant's technology. But as is appropriate for a reply brief, applicants only address certain portions of the Examiner's answer.

All of the pending claims are patentable for the reasons set forth herein, and Appellant respectfully requests such finding.

Three copies of this Reply Brief are provided.

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